



Comparing different approach and avoidance models of learning and personality in the prediction of work, university, and leadership outcomes

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Jackson (2005) developed a hybrid model of personality and learning, known as the learning styles profiler (LSP) which was designed to span biological, socio-cognitive, and experiential research foci of personality and learning research. The hybrid model argues that functional and dysfunctional learning outcomes can be best understood in terms of how cognitions and experiences control, discipline, and re-express the biologically based scale of sensation-seeking. In two studies with part-time workers undertaking tertiary education ($N = 137$ and 58), established models of approach and avoidance from each of the three different research foci were compared with Jackson's hybrid model in their predictiveness of leadership, work, and university outcomes using self-report and supervisor ratings. Results showed that the hybrid model was generally optimal and, as hypothesized, that goal orientation was a mediator of sensation-seeking on outcomes (work performance, university performance, leader behaviours, and counterproductive work behaviour). Our studies suggest that the hybrid model has considerable promise as a predictor of work and educational outcomes as well as dysfunctional outcomes.

How a person learns is a motivational tendency increasingly recognized as central to personality (Carver, 2005; Carver, Sutton, & Scheier, 2000; Corr, 2004; Depue & Collins, 1999; Elliot & Thrash, 2002; Gable, Reis, & Elliot, 2003; Revelle, 1995). Some learning models have been adapted to become models of personality (e.g. Gray's Reinforcement Sensitivity Theory; Gray, 1970, Gray & McNaughton, 2000; Smillie, Pickering, & Jackson, 2006; and for an organizational psychology perspective see Furnham & Jackson, 2008), and some personality models have added *post hoc* learning mechanisms to existing

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biologically based theories (Eysenck, 1967; Zuckerman, 1994). Jackson's (2005, 2008) hybrid model was designed to explain relationships between learning and personality and may provide an understanding of functional and dysfunctional behaviour within organizational, educational, and clinical domains. The aim of the present two studies is to compare the validity of Jackson's hybrid model with some of today's influential models of personality and learning in the prediction of functional work outcomes (leadership behaviours, work performance, commitment, and satisfaction), university outcomes (performance, commitment, and satisfaction), dysfunctional work outcomes (work deviance) as well as deviance in general (delinquency and non-criminal psychopathy).

Personality and learning models

The main overlap between many contemporary prominent learning and personality models is approach and avoidance pathways (e.g. Carver *et al.*, 2000; Elliot & Thrash, 2002; Gable *et al.*, 2003). Approach refers to a learnt motivation aimed at obtaining a reward. Avoidance refers to a learnt motivation to avoid negative outcomes. Approach and avoidance pathways can be theorized as (1) *biological* as reflected by the personality scales of extraversion and neuroticism (e.g. Eysenck, 1967, who argues introverts have higher level of activity in the cortico-reticular loop than extraverts and that neuroticism is related to the visceral brain and autonomic arousal), the learning basis of personality in terms of behavioural activation and inhibition as neurobiological cores of personality (e.g. Gray & McNaughton, 2000), or the combined high approach and low avoidance scale of sensation-seeking with a basis in dopamine pathways (e.g. Zuckerman, 1994), (2) *cognitive* as reflected by learning and performance goals which are state-like, under conscious control and malleable (VandeWalle, 1997), or (3) *experiential* as indicated by doing and reflecting (Honey & Mumford, 1992; Kolb, 1984).

Figure 1 shows the overlap among these different models. It is important to emphasize that Figure 1 represents a simplification as many authors have taken a variety of different viewpoints across their careers. H. J. Eysenck for example developed a biological model of personality (Eysenck, 1967) and is therefore classified in Figure 1 as a major proponent of the biological perspective, but Eysenck also at times refers to the social learning basis of personality (e.g. Eysenck, 1997). Whilst acknowledging that Figure 1 is a simplification, it remains a useful starting-point in understanding the origins, and primary research foci, of different personality models based on approach and avoidance motivations. Aside from Cloninger's clinically focused model of personality which spans the biological and socio-cognitive research foci (Cloninger, Svrakic, & Przybeck, 1993), Jackson's (2005, 2008) hybrid learning in personality model is the only one which was explicitly designed to cross the biological, socio-cognitive, and experiential research foci as shown in Figure 1.

A notable model which is missing from Figure 1 is the Big-5 (e.g. Costa & McCrae, 1992). This is unsurprising since no major biological, socio-cognitive, or experiential basis is claimed. Instead, the Big-5 model of personality is derived by exploratory factor analysis and claims a lexical theory of personality. The Big-5 provides a neat and parsimonious psychometric description of personality but lacks theoretical depth (e.g. Block, 1995).

Jackson's hybrid model

Jackson (2005, 2008) argues that *sensation-seeking* is a high approach and low avoidance construct. Jackson's sensation-seeking is somewhat similar to Zuckerman

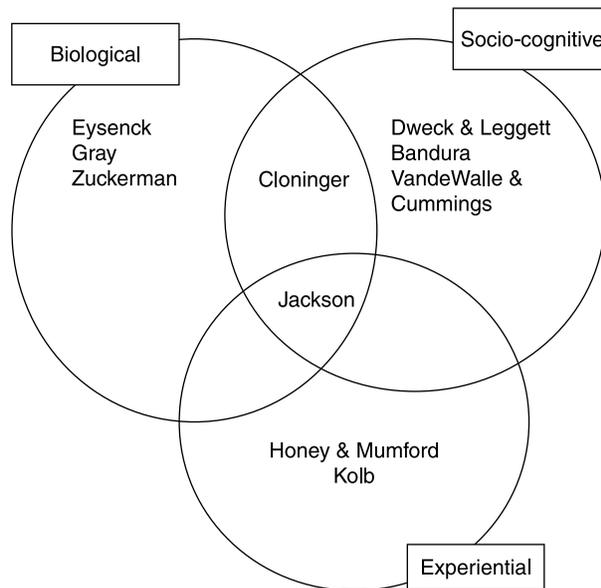


Figure 1. The major personality models of approach and avoidance simplified according to their major research focus.

(1994) except that Jackson argues sensation seekers (SSs) are curious, appetitive, and exploratory whereas Zuckerman argues that SSs are risk takers. Jackson's focus on the learning element of sensation-seeking is inspired by the experimental work of Ball and Zuckerman (1990, 1992) and Pickering (2004) who demonstrated the learning possibilities of sensation-seeking. A further difference between Jackson and Zuckerman is that Jackson defines SSs as being neither implicitly functional nor dysfunctional, whereas Zuckerman (1994) argues that SSs are mainly dysfunctional as a result of their inherent risk taking tendencies.

The socio-cognitive and experiential research foci are also included in Jackson's model. The model argues that a range of cognitions and experiences, but especially goal orientation, re-direct, control, and discipline the primitive exploratory drive of sensation-seeking such that the drive is transformed into more complex, functional adaptive behaviour. In other words, Jackson proposes the theoretical argument that goal orientation mediates sensation-seeking in the prediction of functional outcomes. This is similar to Elliot and Thrash (2002) who argue that learning goal orientation mediates Gray's behavioural activation system in the prediction of educationally related outcomes.

A further interesting characteristic of Jackson's model is that it also identifies sensation-seeking as being the central component of many dysfunctional learning outcomes. The model argues that the direct pathway between sensation-seeking and dysfunctional or deviant behaviour will become stronger once the indirect mediating effects of goal orientation are taken into account. High sensation-seeking is therefore seen as a fundamental drive which leads to deviance or functional success depending on how it is re-expressed by cognitions. Evidence in favour of this perspective is presented by O'Connor and Jackson (2008).

Jackson (2005, 2008) utilizes and develops three well known major socio-cognitive models. The socio-cognitive perspective is represented by: *goal oriented achiever*

(GOA) which is similar to learning goal orientation (Dweck & Leggett, 1988; VandeWalle, 1997); *conscientious achiever* (CA) similar to conscientiousness from the Big-5 (Costa & McCrae, 1992); *emotionally intelligent achiever* (EIA) similar to low neuroticism (Eysenck, 1967); and high emotional intelligence (e.g. Petrides & Furnham, 2000). The experiential model is represented by *deep learning achiever* (DLA) which relates to an interest in deep knowledge (loosely representing Kolb's, 1984, model of experiential learning).

Sensation-seeking is expected to be positively related to complex functional outcomes, such as leadership and work outcomes since these involve high intensity appetitive experience as well as creative thinking and curiosity; all features associated with sensation-seeking (Arnett, 1991, 1994; Domangue, 1984). The positive relationship is most likely to be found between sensation-seeking and functional outcomes in which goal orientation is a mediator. In contrast, Zuckerman's sensation-seeking reflects undesirable characteristics of high approach and low avoidance orientation and seems unlikely to positively predict desirable behaviour such as self-reported work performance (as demonstrated by Reio & Sanders-Reio, 2006). The principal relationships between Jackson's hybrid model and other models of personality and learning are shown in Table 1.

Table 1. Principal relationships between Jackson's hybrid model and other models of learning and personality

Research focus	Jackson's (2005) learning styles profiler	Source
Biological	Sensation seeker: a high approach and low avoidance biologically based curiosity about the world	Sensation seekers (Zuckerman, 1978, 1994; Arnett, 1994)
Socio-cognitive	Goal oriented achiever: focuses appetitive motivations on long term, functional outcomes	Goal orientation (Dweck & Leggett, 1998; VandeWalle, 1997)
Socio-cognitive	Conscientious achiever: provides responsible and insightful understanding about the complex social world in which we live	Conscientiousness (Costa & McCrae, 1992)
Socio-cognitive	Emotionally intelligent achiever: provides rational and logical thinking leading to functional outcomes	Low neuroticism (Eysenck, 1967) and high emotional intelligence (Petrides & Furnham, 2000)
Experiential	Deep learning achiever: provides well thought out and well constructed outcomes	Deep knowledge of subjects (Kolb's 1984 model of experiential learning)

Personality and learning models in the prediction of leadership and work outcomes

Personality has received a great deal of empirical attention in terms of its capacity to predict a range of work-related variables including (but not limited to) job performance (Barrick & Mount, 1991; Hurtz & Donovan, 2000; Judge & Bono, 2001; Robertson & Kinder, 1993; Salgado, 1997; Schmidt & Hunter, 1998; Tett, Jackson, & Rothstein, 1991), job satisfaction (Judge & Bono, 2001; Judge, Heller, & Mount, 2002), organizational commitment (Mathieu & Zajac, 1990; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Moss, McFarland, Ngu, & Kijowska, 2007), leadership (Bono & Judge, 2004; Judge, Bono, Ilies, & Gerhardt, 2002; Lord, De Vader, & Alliger, 1986), academic performance

(Aluja-Fabregat & Torrubia-Beltri, 1998; Chamorro-Premuzic & Furnham, 2003a, 2003b, 2005; O'Connor & Paunonen, 2007; Petrides, Chamorro-Premuzic, Frederickson, & Furnham, 2005; Sanchez-Marin, Rejano-Infante, & Rodriguez-Troyano, 2001), and counterproductive work behaviours (Berry, Ones, & Sackett, 2007). This research has typically focused on the impact of the Big-5 personality traits on important work outcomes, academic performance, and leadership behaviours. However, with the considerable advancements in personality theory and research (as discussed earlier), Furnham and Jackson (2008) lament that a large gap in the literature exists such that biologically, cognitively, and experientially based models of approach and avoidance personality and learning have not been compared in the prediction of work and leadership outcomes. The aim of the current research is to address this gap as well as to apply Jackson's hybrid model of learning in personality.

Overview of the current studies

In the first study, university and work outcomes were conceptualized as three self-report dependent variables recognizing the contextual nature of functional work. Specifically, an individual's work performance is likely to be expressed in three different contexts: as an individual, within a team and as part of a larger organization (Griffin, Neal, & Parker, 2001). Griffin *et al.*'s performance model accounts for task and contextual performance in each of these contexts (i.e. the individual, group, and organizational levels) and assesses not only the individual's compliance with set jobs/obligations, but also the individual's adaptability and proactivity in dealing with change and uncertainty.

Job (university) satisfaction, organizational (university) commitment, and a scale of knowledge of organizational (university) affairs were also used to broaden the contextual nature of the work and university outcomes measured. Job satisfaction and organizational commitment are particularly important job attitudes to examine, given that they may be the key precursors of job performance and other outcomes such as reduced employee turnover (Hom & Griffeth, 1995; Tett & Meyer, 1993).

Prominent leadership researchers have highlighted the need to focus on specific leader behaviours and to examine a broad spectrum of leader behaviours (Kark & Shamir, 2002, van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). Thus, Study 1 incorporated the four components of transformational leadership (i.e. charisma, intellectual stimulation, individualized consideration, and inspirational communication) and the three components of transactional leadership (i.e. contingent reward, active management by exception, and passive management by exception).

In the second study, most of the same work outcomes were again measured as in Study 1. However, two extensions were made. First, it addressed common method variance concerns, by collecting supervisor ratings of subordinate performance (in addition to self-reported job performance). By examining the relationships between self-rated personality and objective supervisor ratings, common method variance concerns are lessened and thus, more confidence can be placed in the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The collection of supervisor ratings of subordinate performance in Study 2 also enabled us to confirm or disconfirm the results of Study 1. Second, it measured additional self-reported criteria - workplace deviance, delinquency, and psychopathy - which may be grouped within a parsimonious, general factor of 'counterproductive work behaviour' (Marcus & Wagner, 2007). As mentioned earlier, counterproductive work behaviours are considered a major component of overall work related outcomes (Rotundo & Sackett, 2002).

Approach is associated with generally positive learning outcomes (Gable, Reis, & Elliot, 2000) and intrinsic and extrinsic rewards associated with success in leadership, at work and university should stimulate approach motivation. In contrast, it was expected that avoidant behaviour, (which is expressed by individuals who tend to want to avoid negative outcomes), will not be related to leadership, work, and university outcomes.

The current research captures a broad range of functional outcomes (across academic and work life) as well as a broad range of dysfunctional outcomes. Jackson (2005, 2008) provides a simple theory driven measurement model inspired by some of the best modern theories of personality from three prominent research foci (see Table 1). From this perspective it is argued that:

H1: Overall, Jackson's (2005) hybrid model of learning in personality will be the most predictive model of a range of outcomes (work outcomes, academic outcomes, and leadership behaviours) compared to other biological, socio-cognitive, and experiential models of personality.

H2: GOA will mediate sensation-seeking in the prediction of a range of outcomes (work outcomes, academic outcomes, and leadership behaviours).

We also test a further component of Jackson's model described above which argues that sensation-seeking predicts dysfunctional behaviour once the indirect pathway of GOA is partialled:

H3: The direct path between sensation-seeking and dysfunctional outcomes will become stronger once the indirect pathway with goal orientation is partialled.

To our knowledge, these studies represent the first time that approach and avoidance personality models from different research foci have been compared against each other in the prediction of leadership behaviours, work, and university outcomes.

STUDY I

Method

Participants and procedure

One hundred and thirty-seven part-time workers undertaking tertiary education completed a questionnaire in a quiet room, while supervised by a research assistant. There were approximately 500 questions in the questionnaire and participants were given 2 hours to complete it. Participants were encouraged to take frequent breaks in order to minimize fatigue.

Demographics

Five items at the beginning of the questionnaire asked participants to disclose their age (mean = 18.13; *SD* = 3.62); sex (44 (32%) males; 92 (67%) females; 1 undisclosed); hours worked (casual 75%, part-time 22%, and full-time 2.2%); and job type (production 4%, administration 70%, service 8%, and other 19%).

Measures of approach and avoidance

The Eysenck personality questionnaire (EPQ-R; Eysenck & Eysenck, 1991); which measures extraversion (active and sociable), neuroticism (anxious and worrier), and

psychoticism (detached and dispassionate); *BIS/BAS scales* (Carver & White, 1994) which measures three components of BAS (drive, fun seeking, and reward responsiveness) and one of BIS (behavioural inhibition system); *Zuckerman's sensation-seeking scales* (Zuckerman, 1978) which measures experience seeking (mental stimulation), disinhibition (impulsivity), thrill and adventure seeking (risky activities), and boredom susceptibility (restlessness); *goal orientation scales* (VandeWalle, 1997) which measures learning goal orientation (mastery of challenging goals), proving performance goal orientation (demonstrating competence), and avoidance performance goal orientation (avoiding negation of competence by self and others); *Honey and Mumford's learning styles questionnaire (LSQ)* (Honey & Mumford, 1992) which measures activist (starting), pragmatist (doing), theorist (integrating), and reflector (thinking); and the *learning styles profiler (LSP)* (Jackson, 2005 as in Table 1).

Dependent measures

Unless otherwise stated, 5-point Likert scales (1 = *strongly disagree* to 5 = *strongly agree*) were used with higher scores denoting high levels of the relevant construct.

Job performance questionnaire (Johnson, 1998) and organizational commitment questionnaire (Johnson, 1998)

The job performance questionnaire contains six items and provides a general measure of overall productivity. An example item is 'I work hard and do my job to the best of my abilities'. The organizational commitment questionnaire contains 15 items and provides a measure of psychological attachment to the organization. An example item is 'I am proud to tell others that I work for this organization'.

Multi-scale performance questionnaire (Griffin et al., 2001)

This instrument is a three-factor measure of task and contextual performance which assesses compliance, adaptability, and proactivity in relation to activities that contribute to outcomes in three contexts - the individual level (labelled job performance, 11 items); team level (labelled team performance, 11 items); and organizational level (labelled organizational performance, 9 items). Example items included 'Thinking about how you have carried out your core job over the past 6 months, to what extent have you carried out the core parts of your job well' (job performance), 'Thinking about your role in your work unit over the past 6 months, to what extent have you coordinated your work with co-workers' (team performance), and 'Thinking about your contribution to the organization over the past 6 months, to what extent have you talked about the organization in positive ways' (organizational performance).

Warr and Payne's job satisfaction questionnaire (Warr & Payne, 1983)

This questionnaire contains the following three items: 'How much do you enjoy your job?' (with the response scale anchored by 1 = *I don't enjoy it* to 5 = *I really enjoy my job and couldn't enjoy it more*), 'How satisfied are you with your job?' (with the response scale anchored by 1 = *I am not at all satisfied* to 5 = *I am extremely satisfied with my job and couldn't be more satisfied*), and 'How happy are you with your job?' (with the response scale anchored by 1 = *I am not happy* to 5 = *I am extremely happy in my job and couldn't be more happy*).

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Knowledge of organizational affairs

This seven-item scale was developed by the first author and assesses what an individual knows about the organization. Example items include 'I know most of my organization's rules that apply to me' and 'I know who does what in my organization', and 'I know the history of my organization'.

Overall work outcomes

An overall measure of work outcomes was calculated for each participant by adding together the z scores of the individual outcomes for work. All of the measures were significantly intercorrelated, with correlations ranging from .21 to .75.

University outcomes

To measure university outcomes, all the above scales were modified so that they measured *academic performance, university commitment, university, group and individual performance, academic satisfaction, and knowledge of university affairs.*

Overall university outcomes

An overall measure of university outcomes was calculated for each participant by adding together the z scores of the individual outcomes for university. All of the measures that comprised the composite were significantly intercorrelated, with correlations ranging from .20 to .60.

Modified multifactor leadership questionnaire (MLQ; Bass & Avolio, 1997)

A modified version of the MLQ, a 36-item questionnaire was used to measure the transformational leadership behaviours of charisma, individual consideration, intellectual stimulation and inspirational communication and the transactional leadership behaviours of contingent reward, passive management by exception and active management by exception. Participants responded on a scale from 1 = *not at all* to 4 = *always*.

Data analysis

To test Hypothesis 1, multiple regression was used to determine the adjusted percentage of variance (R^2) explained by each of the different models. Adjusted R^2 provides a fair comparison between models with different numbers of independent variables but is smaller than non-adjusted R^2 . To examine the hypotheses concerning indirect effects (Hypotheses 2 and 3), analyses followed the method detailed by Baron and Kenny (1986).

Results and discussion

The means, standard deviations, and alpha reliabilities of all the measures are available from the first author. Alpha reliabilities were all generally above 0.70, except for some of the scales of Zuckerman's sensation-seeking and the MLQ.

Correlations among the scales of the learning and personality models with the LSP are shown in Table 2. These correlations provide some evidence for convergent and divergent validity for the LSP which is a relatively newer model of personality.

Specifically, the correlations demonstrate the convergence or distinctiveness of the LSP constructs with the constructs of the other more established learning and personality models. Activist tendencies from the LSQ correlated highly and positively with LSP sensation-seeking while both reflector and theorist did not differentiate in their significant positive correlation with the CA scale. Providing evidence of convergent validity, Zuckerman's sensation-seeking scales significantly positively correlated with LSP sensation-seeking. The dysfunctional component to Zuckerman's sensation-seeking is seen by the negative correlations with Jackson's socio-cognitive and experiential scales which are designed to measure functional outcomes. Fun seeking from the BAS scales correlated quite highly and positively with LSP sensation-seeking. As expected,

Table 2. Correlations between the LSP and the other learning scales in Study 1

	LSP scales				
	SS	GOA	DLA	CA	EIA
LSP					
SS	–	.50**	.25**	.03	–.25
GOA		–	.27**	.41**	.17
DLA			–	.29**	–.06
CA				–	.21*
LSQ					
Reflector	–.02	.20*	.18*	.65**	.09
Theorist	.01	.28**	.22**	.60**	–.04
Pragmatist	.21*	.29**	.11	.36**	–.18*
Activist	.56**	.25**	.11	–.24**	–.41**
Zuckerman					
Experience seeking	.32**	–.01	.11	–.41**	–.00
Disinhibition	.16	–.18*	–.19*	–.40**	–.25**
Thrill and adventure seeking	.28**	.09	.07	–.07	.03
Boredom susceptibility	.28**	.02	–.07	–.37**	–.31**
BIS/BAS					
Drive	.28**	.41**	.11	.06	–.15
Fun seeking	.51**	.04	.09	–.23**	–.17*
Reward responsiveness	.03	.06	.09	.07	.11
Behavioural inhibition system	–.24**	–.28**	.14	.02	–.06
Goal orientation					
Proving goal orientation	.12	.20*	.17	.06	–.25**
Avoidance goal orientation	–.23**	–.20*	–.03	.01	–.28**
Learning goal orientation	.37**	.46**	.31**	.15	.07
EPQ-R					
Extraversion	.45**	.27**	.03	–.17	–.15
Neuroticism	–.09	–.31**	.10	–.12	–.42**
Psychoticism	.22*	–.08	–.02	–.37**	–.37**
Lie scale	–.03	.08	–.05	.23**	.18*

Note. LSP, Jackson's learning styles profiler; LSQ, Honey and Mumford's learning styles questionnaire; Zuckerman, Zuckerman's sensation-seeking scales; BIS/BAS, Carver and White's (1994) behavioural inhibition and behavioural activation system scales; Goal orientation, Vandewalle's (1997) goal orientation scales; EPQ-R, Eysenck and Eysenck's (1991) Eysenck personality questionnaire – revised; EIA, emotionally intelligent achiever; SS, sensation seekers; GOA, goal oriented achiever; DLA, deep learning achiever; CA, conscientious achiever. * $p < .05$; ** $p < .01$.

learning goal orientation correlated most highly and positively with GOA but also significantly positively correlated with sensation-seeking and DLA. Extraversion correlated most highly and positively with LSP sensation-seeking and psychoticism was negatively correlated with CA and EIA.

Work outcomes

The regression results for the associations between the learning and personality scales and work outcomes are provided in Table 3.¹ Jackson's sensation-seeking was predictive of four measures of work outcomes, Jackson's GOA scale was predictive of two measures of work outcomes, and Jackson's CA was predictive of one measure of work outcomes. VandeWalle's learning goal orientation scale was predictive of all but one measure of work outcomes and VandeWalle's avoidance goal orientation scale was predictive of all but two measures of work outcomes. Eysenck's extraversion was predictive of all but two work outcomes whereas the BIS/BAS scales, Zuckerman's scales, and Honey and Mumford's LSQ possessed limited predictive ability. In combination, VandeWalle's goal orientation scales explained between 6 and 19%; Jackson's LSP explained between 0.2 and 13%; the EPQ explained between 0 and 11%; and the other models explained consistently close to 0%.

University outcomes

The regression results for the associations between the learning models and university outcomes are shown in Table 4.¹ The most predictive scales were Jackson's GOA and CA, and drive of the BAS scales. Reasonably predictive scales included Vandewalle's learning goal orientation, Eysenck's low psychoticism, and reward responsiveness of the BAS scales. Low disinhibition of the Zuckerman's scale had some predictive capacity and the least predictive scale was the LSQ from Honey and Mumford. VandeWalle's goal orientation scales explained between 0 and 15%; Jackson's LSP explained between 6 and 27%; BIS/BAS scales explained between 5 and 17%; and the other models explained close to 0%.

Leadership behaviours

The regression results for the associations between the learning models and leadership behaviours are shown in Table 5.¹ The most predictive scales were drive and fun seeking from the BAS, Jackson's GOA and DLA, and VandeWalle's learning goal orientation. The next most predictive scales were extraversion from the EPQ-R, and Jackson's sensation-seeking. The least predictive scales were the sensation-seeking scales by Zuckerman and the LSQ by Honey and Mumford. VandeWalle's goal orientation scales explained between 3 and 22%; Jackson's LSP explained between 2 and 24%; BIS/BAS scales explained between 4 and 15%; the EPQ explained between 3 and 21%; and the other models explained close to 0%.

¹ The correlations among the variables are available by request from the first author.

Table 3. Regression results between the learning scales and work outcomes in Study I

Learning scale	Work outcomes							
	Multi-scale performance					Job satisfaction	Knowledge of organizational affairs	Overall work outcomes
	Job performance	Organizational commitment	Organizational performance	Group performance	Job performance			
LSP								
Sensation seeker	.15	.24*	.25*	.07	.28**	.15	-.01	.23*
Goal oriented achiever	.16	-.02	.22*	.30**	.04	.14	.08	.21
Deep learning achiever	.02	.07	-.05	-.02	.02	.07	.05	.03
Conscientious achiever	.01	.22*	.01	-.09	.18	.003	-.01	.07
Emotionally intelligent achiever	.13	.02	-.06	.02	.04	.03	-.10	.02
<i>F</i>	2.48*	3.75**	5.13***	2.92*	4.23***	2.10	1.06	5.20***
Adjusted <i>R</i> ²	.05	.09	.13	.07	.11	.04	.002	.13
LSQ								
Reflector	.12	.10	.01	.04	.09	.07	-.07	.07
Theorist	-.20	-.10	-.13	-.18	.01	-.22	-.08	-.18
Pragmatist	.21	.16	.22	.19	.14	.21	.28*	.29*
Activist	.08	.09	.09	.08	.10	.07	-.04	.09
<i>F</i>	1.70	1.33	1.77	1.34	1.89	1.48	1.59	2.72*
Adjusted <i>R</i> ²	.02	.01	.05	.01	.03	.01	.02	.05
Zuckerman								
Experience seeking	.07	-.02	.03	.07	.05	.06	-.11	.03
Disinhibition	-.20*	-.10	-.05	-.09	-.31**	-.13	-.04	-.19
Thrill and adventure seeking	.04	.11	.18*	.01	.12	.04	.09	.12
Boredom susceptibility	.08	-.06	.05	.06	.11	-.001	-.02	.04
<i>F</i>	1.03	1.11	1.23	.30	2.91*	.50	.73	1.26
Adjusted <i>R</i> ²	.001	.003	.01	-.02	.05	-.02	-.01	.01
BIS/BAS								
Drive	.16	-.06	.07	.06	.03	-.02	.05	.06
Fun seeking	-.12	.20*	.23*	.13	.11	.12	-.09	.12
Reward responsiveness	-.03	-.11	-.06	.10	-.15	-.06	-.06	-.08
Behavioural inhibition system	-.25**	.03	-.10	-.24**	-.16	-.15	-.11	-.20*

Table 3. (Continued)

Learning scale	Work outcomes							
	Multi-scale performance					Job satisfaction	Knowledge of organizational affairs	Overall work outcomes
	Job performance	Organizational commitment	Organizational performance	Group performance	Job performance			
<i>F</i>	2.94*	1.24	2.50*	3.31*	2.13	1.40	0.90	2.21
Adjusted <i>R</i> ²	.05	.01	.04	.06	.03	.01	-.003	.03
Goal orientation								
Proving goal orientation	.11	-.10	.06	.12	-.07	.06	.05	.05
Avoidance goal orientation	-.23*	-.01	-.19*	-.30**	-.23*	-.26**	-.06	-.26**
Learning goal orientation	.20*	.29**	.34***	.16	.26**	.19*	.28**	.35**
<i>F</i>	4.94**	3.68*	9.18***	5.81***	7.09***	5.34**	4.52**	11.29***
Adjusted <i>R</i> ²	.08	.06	.15	.10	.12	.09	.07	.19
EPQ-R								
Extraversion	.12	.29***	.26**	.28***	.07	.29***	.23**	.31***
Neuroticism	-.11	-.002	.04	-.03	.01	-.10	.16	-.01
Psychoticism	-.04	-.17*	-.08	-.01	.01	-.03	.07	-.05
Lie scale	.07	.16	.18*	.08	.21*	.06	.17	.19*
<i>F</i>	1.41	5.06***	3.22*	3.12*	1.43	3.87**	2.72*	4.60**
Adjusted <i>R</i> ²	.01	.11	.06	.06	.01	.08	.05	.10

Note. **p* < .05; ***p* < .01; ****p* < .001.

Table 4. Regression results between the learning scales and university outcomes in Study I

Learning scale	University outcomes							
	Academic performance	University commitment	Multi-scale performance			Academic satisfaction	Knowledge of university affairs	Overall university outcomes
			University performance	Group performance	Individual performance			
LSP								
Sensation seeker	.10	-.02	-.08	-.09	.05	-.13	.05	-.03
Goal oriented achiever	.28**	.13	.20	.34**	.18	.24*	.28*	.36***
Deep learning achiever	.00	.24**	.14	.12	.16	.06	.03	.12
Conscientious achiever	.25**	.15	.09	.01	.22*	.14	.15	.21*
Emotionally intelligent achiever	.07	.13	.00	.01	.07	.08	.08	.07
<i>F</i>	8.92***	5.42***	2.64*	3.90**	6.58***	3.46**	5.66***	11.00***
Adjusted <i>R</i> ²	.23	.14	.06	.10	.17	.08	.15	.27
LSQ								
Reflector	.21	.23	.22	-.03	.17	.27*	-.02	.19
Theorist	-.05	.08	-.20	.22	.11	-.02	.12	.04
Pragmatist	-.01	-.02	.11	.00	-.09	-.02	.11	.02
Activist	.22*	.08	.07	.04	.24**	.02	.11	.17
<i>F</i>	2.25	2.73	1.34	1.44	3.01*	2.13	1.93	2.76*
Adjusted <i>R</i> ²	.04	.05	.01	.01	.06	.03	.03	.05
Zuckerman								
Experience seeking	-.01	.20*	.21*	.09	.12	.19*	-.02	.14
Disinhibition	-.25**	-.13	-.18	-.24*	-.32***	-.20*	-.13	-.32**
Thrill and adventure seeking	.01	-.07	-.03	-.02	.02	-.07	-.01	-.02
Boredom susceptibility	.01	-.14	-.05	-.03	.00	-.12	-.02	-.05
<i>F</i>	2.18	2.00	1.66	1.84	3.09*	2.48*	0.78	3.44**
Adjusted <i>R</i> ²	.03	.03	.02	.02	.06	.04	-.006	.07
BIS/BAS								
Drive	.45***	.12	.20*	.21*	.28**	.13	.25**	.36***
Fun seeking	-.09	-.07	-.07	-.14	-.03	-.14	-.14	-.15
Reward responsiveness	-.04	.24*	.23*	.16	.10	.20*	.09	.17

Table 4. (Continued)

Learning scale	University outcomes							
	Academic performance	University commitment	Multi-scale performance			Academic satisfaction	Knowledge of university affairs	Overall university outcomes
			University performance	Group performance	Individual performance			
Behavioural inhibition system	-.01	.10	.10	.06	.01	.05	-.02	.05
<i>F</i>	6.69***	4.00**	2.36***	3.30*	3.92**	2.61*	2.71*	7.79***
Adjusted <i>R</i> ²	.14	.08	.11	.06	.08	.05	.05	.17
Goal orientation								
Proving goal orientation	.08	.21*	.04	.09	-.03	.14	.25**	.13
Avoidance goal orientation	-.06	-.11	-.003	-.06	.06	-.18	-.10	-.08
Learning goal orientation	.16	.14	.11	.17	.32***	.08	.27**	.27**
<i>F</i>	1.88	3.71*	0.68	2.24	4.69**	2.08	9.00***	5.52***
Adjusted <i>R</i> ²	.02	.06	-.007	.03	.08	.02	.15	.09
EPQ-R								
Extraversion	.19*	.12	.08	.10	.15	-.03	.23**	.17*
Neuroticism	-.03	.15	.07	.07	.04	.07	.08	.07
Psychoticism	-.18*	-.25**	-.16	-.15	-.17*	-.24	-.15	-.25**
Lie scale	.07	.09	.13	.07	.18*	.02	.08	.13
<i>F</i>	2.87*	2.90*	1.48	1.10	2.59*	2.07	2.50*	3.58**
Adjusted <i>R</i> ²	.05	.05	.01	.00	.05	.05	.04	.07

Note. **p* < .05; ***p* < .01; ****p* < .001.

Table 5. Regression results between the learning scales and leadership behaviours in Study 1

Learning scale	Modified multifactor leadership (MLQ; Bass & Avolio, 1997)						
	Charisma	Intellectual stimulation	Individual consideration	Inspirational communication	Contingent reward	Active management by exception	Passive management by exception
LSP							
Sensation seeker	.19	.25**	.19	.18	.03	.17	.17
Goal oriented achiever	.31**	.21*	.18	.14	.23*	-.05	-.15
Deep learning achiever	.07	.23**	.13	.26**	.14	-.08	-.16
Conscientious achiever	.00	-.03	-.05	-.08	.00	.05	-.11
Emotionally intelligent achiever	.17*	.14	.15	.27**	.02	-.16	-.20*
<i>F</i>	8.13***	9.69***	4.49***	7.24***	2.72*	1.67	4.87***
Adjusted <i>R</i> ²	.21	.24	.11	.19	.06	.02	.13
LSQ							
Reflector	.07	.05	-.02	.10	.02	-.28*	-.06
Theorist	.04	.06	.17	.04	-.03	.32*	.06
Pragmatist	-.02	.08	-.08	-.11	.22	.12	-.07
Activist	.18	.18	.10	.17	.07	.07	.16
<i>F</i>	1.26	2.12	0.72	1.02	1.93	3.84**	0.95
Adjusted <i>R</i> ²	.01	.03	-.008	.00	.03	.08	-.002
Zuckerman							
Experience seeking	.22*	.19*	.09	.07	-.01	-.25**	-.10
Disinhibition	-.08	-.11	.00	-.03	.00	.30**	.31**
Thrill and adventure seeking	.01	.06	.19*	.07	.13	.20*	.04
Boredom susceptibility	-.04	.11	.07	-.09	-.05	.07	.13
<i>F</i>	1.34	1.72	2.18	0.60	0.61	5.00***	4.77***
Adjusted <i>R</i> ²	.01	.02	.03	-.01	-.01	.10	.10
BIS/BAS							
Drive	.16	.27**	.18	-.09	.19*	.21*	.07
Fun seeking	.17*	.16	.25**	.27**	.11	.07	.26**
Reward responsiveness	.16	-.005	-.08	.23*	.12	.09	-.11
Behavioural inhibition system	-.26**	-.24**	-.09	.00	-.12	.06	-.02
<i>F</i>	7.18***	6.77***	4.26**	5.51***	3.99**	3.66**	2.49*
Adjusted <i>R</i> ²	.15	.15	.09	.12	.08	.07	.04

Table 5. (Continued)

Learning scale	Modified multifactor leadership (MLQ; Bass & Avolio, 1997)						
	Charisma	Intellectual stimulation	Individual consideration	Inspirational communication	Contingent reward	Active management by exception	Passive management by exception
Goal orientation							
Proving goal orientation	.10	.06	.00	.16	.17	.29**	.12
Avoidance goal orientation	-.07	-.13	-.05	-.18	-.04	.10	.05
Learning goal orientation	.36***	.44***	.33***	.17	.24**	-.12	-.22*
<i>F</i>	8.79***	13.45***	5.77***	4.03**	5.41**	5.58***	2.55
Adjusted <i>R</i> ²	.15	.22	.10	.06	.09	.09	.03
EPQ-R							
Extraversion	.39***	.24	.24**	.39***	.25**	.13	.06
Neuroticism	-.10	-.09	.05	-.02	-.08	.26**	.14
Psychoticism	-.13	.06	-.06	-.28***	-.11	.13	.27**
Lie scale	.20*	.10	.11	-.01	.00	-.05	.00
<i>F</i>	9.95***	2.97*	2.20	10.04***	3.24*	4.29**	3.83**
Adjusted <i>R</i> ²	.21	.06	.03	.21	.06	.09	.08

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Mediating role of goal oriented achiever

The mediating role of GOA on the association between sensation-seeking and overall work outcomes, overall university outcomes and leadership behaviours was examined using multiple regression and by following the procedure of Baron and Kenny (1986). Specifically, Baron and Kenny (1986) suggest that in order for a variable to function as a mediator it must meet the following conditions: first, the independent variables (sensation-seeking) must be shown to affect the dependent variable (overall work outcomes, overall university outcomes, and leadership behaviours) in the regression equation; second, the independent variables (sensation-seeking) must affect the mediator (GOA) in the second regression equation; and finally, in a third regression, the mediator (GOA) should have a significant effect on the dependent variable (overall work outcomes, overall university outcomes, and leadership behaviours) while the independent variables' (sensation-seeking) effects are ameliorated. Complete mediation is indicated when the effect of the independent variable on the dependent variable is not significant in the final regression, whereas partial mediation is indicated when the effect is reduced but is still significant. The amount of mediation or the indirect effect is calculated using the Sobel (1982) formula.

The mediation paths are shown in Figure 2 and results showed that GOA partially mediated sensation-seeking in the prediction of overall work outcomes and the intellectual stimulation component of leadership, and was a complete mediator of overall university outcomes and charisma, individual consideration, contingent reward, and inspirational communication components of leadership. Results of the Sobel test confirmed the significance of the mediations as follows (overall work outcomes: $t = 2.54, p = .011$; overall university outcomes: $t = 4.63, p < .001$; charisma: $t = 3.60, p < .001$; individual consideration: $t = 2.14, p = .032$; contingent reward: $t = 2.10, p = .036$; intellectual stimulation: $t = 2.80, p < .001$; and inspirational communication: $t = 2.74, p = .006$).

This study examined the associations between a comprehensive set of learning and personality scales and various work and university outcomes and leadership behaviours. Overall, the hypothesis that Jackson's hybrid model of learning in personality is the

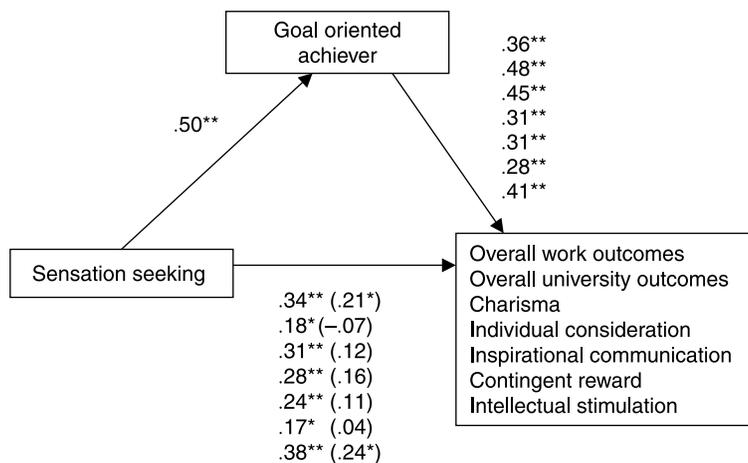


Figure 2. Mediation of sensation-seeking by goal oriented achiever in the prediction of overall work, overall university and leadership outcomes in Study 1. Note. The numbers in parentheses are the mediated beta weights.

most predictive (Hypothesis 1) was generally supported although Vandewalle's goal orientation model was also successful. Importantly, the specific hypotheses that Jackson's goal orientation achiever scale mediates the effects of sensation-seeking on functional work outcomes was also supported (Hypotheses 2). Other models, even though widely used, have been demonstrated to have less validity. The least predictive of work outcomes was Honey and Mumford's (1992) LSQ.

Limitations of the current study should be noted. Most notably, the measures of behavioural outcomes and leadership behaviours were self-report which may contribute to inflated relationships between the variables due to the action of common method variance and social desirability (Podsakoff *et al.*, 2003) although a meta-analysis by Ones, Viswesvaran, and Reiss (1996) on this subject suggests that this effect is likely to be only modest; a viewpoint also shared by Spector (2006). Moreover, it should be noted that the key aim of this first study was to *compare* different models of approach and avoidance, and inflation of correlations is likely to have affected all the models to the same extent. Thus, any inflation of associations will not have had any effect on their differential validity.

The aims of the second study were to replicate Study 1 and conduct a more stringent evaluation of the various personality models by determining the extent that they predict objective criteria as collected from supervisors. To further extend the gamut of outcomes, counterproductive behaviours (workplace deviance, delinquency, and psychopathy) were also measured via self-report.

STUDY 2

Method

Participants and procedure

Three hundred part-time workers undertaking tertiary education completed a questionnaire on a computer in a quiet room, while supervised by a research assistant. Data collection took 2 years. Participants were requested to provide their work supervisor's e-mail address so that a questionnaire could be e-mailed to the supervisor. Of the 300 participants, 58 supervisors responded to the request (19.33% response rate). It is important to note that each dyad almost certainly did not overlap with any other dyad (i.e. the data from each dyad was independent) and that each dyad was almost certainly from a different organization.

The computer-based program automatically generated two e-mails addressed to the participant's supervisor. The e-mails were sent after the participants actively consented to them being dispatched. The first e-mail was addressed from the participant and provided consent for the researchers to contact the supervisor and request performance ratings. The second e-mail was addressed from the researchers and explained the general research topic, confidentiality issues, and contained a URL link to the supervisor survey.

Demographics

Five items at the beginning of the questionnaire asked participants to disclose their age (mean = 19.34, *SD* = 3.52), hours worked (casual 56.9%, part-time 37.9%, and full-time 5.2%), company size (small 39.7%, medium 27.6%, and large 32.8%), and job type

(production 5.2%, administration 48.3%, service 17.2%, and other 29.3%). There were 19 male and 39 female employees.

Measures of approach and avoidance

The same measures of approach and avoidance were used as in Study 1, with the exception of Zuckerman's sensation-seeking scales, and Honey and Mumford's LSQ which Study 1 showed were not predictive of self-report ratings of performance. In addition, the Big-5 model of personality was measured using the NEO-IPIP (Goldberg, 1999) which provides a measure of extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness.

Dependent measures

In the participant's questionnaire, self-reported job performance was measured using Johnson's (1998) job performance questionnaire (as was used in Study 1). Counter-productive work behaviours were measured using Bennett and Robinson's (2000) workplace deviance scale (example item: 'In the past year have you played a mean prank on someone at work') which measures the amount of deviant behaviour directed towards the organization and other employees, Furnham and Thompson's (1991) delinquency scale (example item: 'I have sold an illegal drug') which provides a general measure of 'everyday' deviant behaviour associated with theft, tax avoidance, cheating, drug use and violence, and the overall scale of Lilienfeld and Andrews' (1996) non-criminal psychopathy scale (example item: 'It might be fun to belong to a group of "bikers" (motorcyclists) who travel around the country and raise some hell.') which measures affective-interpersonal and personality psychopathic tendencies.

In the supervisor's questionnaire, job performance was measured using the same scales used in Study 1 but adapted for use by supervisors in that items were automatically reworded by the software to refer by name to the follower and to adjust for the sex of the follower. These scales were Johnson's (1998) job performance questionnaire and Griffin *et al.*'s (2001) multi-scale performance questionnaire (e.g. item for a male follower: '[follower's name] works hard and does his job to the best of his abilities'). An overall measure of supervisor-rated work performance was also computed by averaging all of the supervisor ratings of employee performance.

Results and discussion

Means, standard deviations, and alpha reliabilities of all variables used in Study 2 are available upon request to the authors. In this Study, alpha reliabilities were generally all at least satisfactory with only one less than .70. The correlation between self-rated performance and overall supervisor ratings of performance was significant ($r = .28$, $p = .03$) which provides reasonable evidence of convergent validity between the self-reported ratings of Study 1 and supervisor ratings of Study 2 and, therefore, provides further justification for the use of self-report ratings of performance.

Correlations among the scales of the learning models with the LSP are shown in Table 6. Again, results generally supported the construct validity of the LSP such that sensation-seeking was related to high approach scales (such as BAS drive and BAS fun seeking) and extraversion. GOA was highly related to other approach scales of learning goal orientation, BAS drive, and extraversion. DLA was highly correlated with openness

Table 6. Correlations between the LSP and the other learning scales in Study 2

Learning scale	Learning styles profiler scales				
	SS	GOA	DLA	CA	EIA
LSP					
Sensation seeker (SS)	–	.58**	.18	.03	–.07
Goal oriented achiever (GOA)		–	.12	.31*	.07
Deep learning achiever (DLA)			–	.29*	–.19
Conscientious achiever (CA)				–	–.12
BIS/BAS					
Drive	.53***	.41***	.07	.14	–.30*
Fun seeking	.51**	.18	.18	–.18	–.23
Reward responsiveness	.03	.18	.11	.14	–.12
Behavioural inhibition system	–.07	–.06	–.09	.18	–.22
Goal orientation					
Proving goal orientation	.14	.20*	.10	.02	–.13
Avoidance goal orientation	–.02	–.20*	–.10	–.11	–.32*
Learning goal orientation	.30*	.46**	.22	.05	–.02
EPQ-R					
Extraversion	.56***	.36**	–.10	–.05	.07
Neuroticism	.06	–.10	.22	.09	–.47***
Psychoticism	.31*	.08	.26*	–.22	–.28*
Lie scale	.004	.14	.14	.12	.23
NEO IPIP					
Extraversion	.33*	.31*	–.16	–.12	.36**
Neuroticism	.06	–.03	.16	.20	–.48***
Agreeableness	.10	.04	.17	.00	.26
Conscientiousness	.04	.20	.12	.35**	.36**
Openness to experience	.31*	.20	.53***	.10	.06

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

to experience, CA was correlated with conscientiousness of the NEO-IPIP and EIA was negatively correlated with neuroticism.

Work outcomes

The regression results for the associations between the learning scales and work outcomes are provided in Table 7.¹ A significant amount of variance in all but two of the work outcomes was accounted for by Jackson's LSP. Sensation-seeking was a significant *negative* predictor of supervisor-rated organizational performance and a significant *positive* predictor of self-rated psychopathy. GOA was positively related to supervisor rated job performance, organizational performance, and overall performance. CA was significantly negatively related to self-rated psychopathy. EIA was positively related to both measures of supervisor rated job performance, overall performance and significantly negatively related to workplace deviance. Altogether, Jackson's model account for between 9 and 20% of the variance in supervisor ratings and between 18 and 26% in dysfunctional behaviours.

BIS/BAS explained a significant amount of variance in the counterproductive work behaviours of workplace deviance, delinquency, and psychopathy (between 18 and 50%)

Table 7. Regression results between the learning scales and work outcomes in Study 2

Learning scale	Work outcomes								
	Self-rated job performance	Supervisor-rated job performance	Supervisor-rated multi-scale performance			Supervisor-rated overall performance	Self-rated work-place deviance	Self-rated delinquency	Self-rated psychopathy
			Organizational performance	Group performance	Job performance				
LSP									
Sensation seeker	.08	-.30	-.31*	-.24	-.15	-.26	.25	.22	.30*
Goal oriented achiever	.20	.43**	.45**	.32	.28	.39*	-.26	-.20	.13
Deep learning achiever	.09	.01	-.06	-.11	.02	-.04	.14	.36**	.21
Conscientious achiever	.06	.07	.14	.13	.08	.12	-.01	-.26	-.34**
Emotionally intelligent achiever	.18	.29*	.23	.23	.30*	.28*	-.36**	-.23	-.22
<i>F</i>	1.42	3.50**	3.81**	2.44*	2.12	3.23**	3.48**	4.34**	4.92***
Adjusted <i>R</i> ²	.04	.18	.20	.11	.09	.16	.18	.23	.26
BIS/BAS									
Drive	.20	-.26	-.17	-.18	-.23	-.22	-.25	-.02	.16
Fun seeking	-.07	.17	.16	.06	.13	.14	.51**	.68***	.42***
Reward responsiveness	.04	-.07	-.04	-.04	.03	-.03	.14	-.32*	-.06
Behavioural inhibition system	-.15	.28	.13	.25	.18	.21	.02	.02	-.51***
<i>F</i>	0.57	1.31	0.41	0.97	0.67	0.80	4.14**	6.30***	15.18***
Adjusted <i>R</i> ²	.00	.02	.00	.00	.00	.00	.18	.28	.50
Goal orientation									
Proving goal orientation	-.06	.03	-.06	.02	.07	.01	.05	-.05	-.14
Avoidance goal orientation	-.05	-.46***	-.46***	-.41**	-.37**	-.45**	.21	.37**	.13
Learning goal orientation	.22	-.21	-.19	-.20	-.09	-.18	.07	.11	.31*

Table 7. (Continued)

Learning scale	Work outcomes								
	Self-rated job performance	Supervisor-rated job performance	Supervisor-rated multi-scale performance			Supervisor-rated overall performance	Self-rated work-place deviance	Self-rated delinquency	Self-rated psychopathy
			Organizational performance	Group performance	Job performance				
<i>F</i>	1.05	4.25**	4.92**	3.31*	2.35	4.02**	0.90	2.30	1.72
Adjusted <i>R</i> ²	.003	.15	.17	.11	.07	.14	.00	.07	.04
EPQ-R									
Extraversion	.29*	.05	.12	.09	.09	.10	.07	.15	.22*
Neuroticism	-.02	-.04	.02	.06	.03	.03	.17	.03	-.33**
Psychoticism	-.23	-.17	-.02	-.16	-.10	-.11	.37**	.43***	.61***
Lie scale	.10	-.05	.07	.07	.06	.05	-.27*	-.39***	.07
<i>F</i>	2.21	0.43	0.22	0.49	0.26	0.31	6.92***	11.82***	16.17***
Adjusted <i>R</i> ²	.08	.00	.00	.00	.00	.00	.29	.44	.52
NEO-IPIP									
Extraversion	.20	-.06	-.09	-.09	-.05	-.08	.06	.18	.26
Neuroticism	-.05	-.07	.01	.08	.10	.05	.23	.12	-.26*
Agreeableness	.08	.27	.22	.31	.39*	.33	-.23	-.21	-.44**
Conscientiousness	.15	-.10	.04	-.01	-.02	-.01	-.16	-.38**	-.16
Openness to experience	.27*	-.14	-.13	-.22	-.15	-.17	.16	.20	.41**
<i>F</i>	2.86*	0.69	0.41	0.88	1.33	0.84	1.72	2.65*	3.90**
Adjusted <i>R</i> ²	.14	.00	.00	.00	.03	.00	.06	.13	.20

Note. **p* < .05; ***p* < .01; ****p* < .001.

with fun seeking being a significant positive predictor and reward responsiveness and behavioural inhibition system being negative predictors. BIS/BAS scales failed however to predict functional work outcomes. VandeWalle's goal orientation scales also successfully explained a significant amount of variability in the outcome measures of supervisor rated performance with avoidance goal orientation being a significant negative explanatory variable (between 7 and 17%). These scales did not however predict negative outcomes very well. Eysenck's EPQ-R also explained a significant amount of variance in the negative work behaviours, with all four scales (extraversion, neuroticism, psychoticism, and lie) having a significant effect with one or more of the outcomes (explaining between 29 and 52%). However the EPQ-R failed to predict functional work outcomes. The NEO-IPIP was the only scale that significantly predicted self-rated job performance, wherein openness to experience was a significant positive predictor. The scales also accounted for a significant amount of variance in delinquency and psychopathy, wherein neuroticism, agreeableness, conscientiousness, and openness to experience were significant predictors of these outcomes (explaining between 6 and 20% of the variance). However, the NEO-IPIP failed to significantly predict functional work outcomes as rated by supervisor.

Mediating role of goal oriented achiever

As expected, GOA provided a positive indirect pathway between sensation-seeking and functional work outcomes. Interestingly, sensation-seeking became a significant *negative* predictor of functional work outcomes when the indirect pathway was included in the regression model whereas it was simply non-significant when the indirect pathway was not included in the model. This result argues that only the re-expression of sensation-seeking through the positive indirect pathway (of GOA) is functional and that which is left is dysfunctional. Such a result is reminiscent of the findings of Reio and Sanders-Reio (2006) who report a negative relationship between Zuckerman's sensation-seeking and work outcomes (see Figure 3).

In contrast, in the prediction of counterproductive work behaviours and functional work outcomes, the opposite relationship was found. The indirect pathway was generally negative such that GOA had a negative relationship with counterproductive work behaviours and work outcomes, and the inclusion of this pathway led to a positive relationship between sensation-seeking and counterproductive work behaviours and other work outcomes. On the basis of these results, it is argued that Jackson's sensation-seeking provides a common basis to functional as well as dysfunctional (i.e. counterproductive work) behaviour in the workplace and that it is only the re-expression of sensation-seeking through goal orientated achiever that leads to functional behaviour. Interestingly, supervisors clearly do not view sensation-seeking in a positive way, once the effects of GOA have been removed. This is understandable since sensation-seeking positively predicts dysfunctional outcomes. On the other hand, self-ratings of performance from Study 1 did not have a significant direct relationship with sensation-seeking.

This study provides additional insights into how approach and avoidance learning and personality models predict supervisor ratings of functional performance and self-ratings of dysfunctional performance. The methodology involved in this study has the advantage of using individual supervisor-follower dyads such that each supervisor was rating just one follower, whereas most studies involving such dyads generally involve each supervisor rating multiple followers (e.g. Aryee, Chen, Sun, & Debrah, 2007;

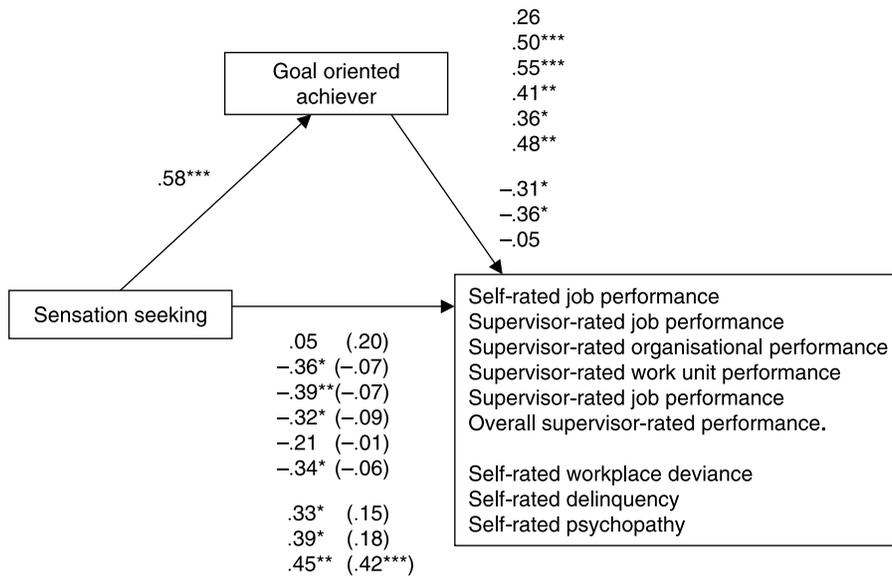


Figure 3. Mediation of sensation-seeking by goal oriented achiever in the prediction of functional work outcomes and dysfunctional behaviour in Study 2. *Note.* The numbers in parentheses are the mediated beta weights.

Bono & Judge, 2003; Dvir, Eden, Avolio, & Shamir, 2002; Wang, Law, Hackett, Wang, & Chen, 2005). This has the advantage of increasing generalisability of results and reducing the potential bias from ‘within supervisor across follower’ effects. A further advantage of our methodology is that each dyad was almost certainly from a different organization which again enhances the generalisability of results. However, a consequence of this methodology is that the sample size of dyads was not as large as desired. Nevertheless, the consistency and significance of results across multiple criteria and the support for the proposed model strongly suggests that the sample size was sufficient to detect the effects present in the results.

GENERAL DISCUSSION

Approach and avoidance pathways in personality have been understood in terms of biology (Eysenck, 1967; Gray & McNaughton, 2000; Zuckerman, 1994), cognitions (VandeWalle, 1997), and experiences (Honey & Mumford, 1992) and also as a hybrid form in which cognitions and experiences are mediators of biological mechanisms (Jackson, 2005). The main finding of the two studies is that there was considerable variability in the usefulness of different learning and personality models in the prediction of work and university outcomes as well as leadership behaviours. Some learning and personality models were consistently strong predictors of these criteria whereas others were much weaker.

It was not the purpose of this research to take a fine-grained analysis of the predictive capacity of each particular model and, in fact, there was little in the way of a discernible pattern. Instead, the purpose of this research was to determine which models were generally predictive of a variety of outcomes and which were not. Overall, the strongest predictor was Jackson’s hybrid model of the LSP which consistently predicted work

(Studies 1 and 2), university outcomes (Study 1), leadership (Study 1), and dysfunctional outcomes (Study 2). The LSP explained a significant amount of variance in all but two of the self-reported work outcomes, all of the university outcomes, all but one of the leadership behaviours, all of the supervisor-rated work performance outcomes and all of the dysfunctional outcomes. The appetitive approach scales of SS and GOA were the best predictors. The usefulness of goal orientation was further demonstrated by the sound predictiveness of VandeWalle's learning goal orientation scale. Results also strongly supported Jackson's contention that the cognitive-based GOA is a mediator or cognitive re-expression of biologically based sensation-seeking in the prediction of work outcomes, university outcomes, and leadership behaviours.

The least successful learning model was the LSQ proposed by Honey and Mumford. The LSQ scales rarely predicted work and university outcomes or leadership behaviours. As well as the substantial criticisms of this model from other perspectives (Duff & Duffy, 2002; Swailes & Senior, 1999), our study shows that this learning model has very little validity.

In Study 1, university outcomes tended to be better predicted by most learning models than work outcomes. In the prediction of university work criteria, BAS drive, BAS reward seeking, low psychoticism, and conscientiousness were reasonably good predictors but they were much less predictive of work outcomes. Such results are unsurprising since university outcomes are probably more clearly related to personality due to the relative standardization and fairness of student opportunities and situations. Also data were collected within a single university as opposed to many organizations.

The correlations between Jackson's LSP and Zuckerman's sensation-seeking scales (Study 1) and the mediating effects of GOA on Jackson's sensation-seeking are also of interest. Most of Zuckerman's (1978) scales correlated positively with Jackson's sensation-seeking which provides satisfactory construct validity, yet there are fundamental differences between Zuckerman's and Jackson's conceptualization of sensation-seeking. Zuckerman's sensation-seeking scales tended to have a negative relationship with Jackson's scale of CA whereas this was not the case for Jackson's scale of sensation-seeking. This result highlights the focus of Zuckerman on dysfunctional approach behaviour as opposed to Jackson's less judgemental view of sensation-seeking. Having said this, Jackson's sensation-seeking behaved as Zuckerman's sensation-seeking would be expected to behave once the indirect pathway through GOA was included in the model (as shown in Study 2) such that Jackson's sensation-seeking was then associated with less desirable outcomes.

Evidence has been presented that Jackson's sensation-seeking provides a basis of both functional and dysfunctional outcomes. From this perspective, it can be argued that it provides an innovative theory-driven model of learning and personality with considerable promise. It provides a parsimonious integration of different research foci (biological, cognitive, and experiential), a balance between learning and personality, and the power to predict functional and dysfunctional outcomes. The LSP also partitions learning and personality into components that are either difficult to train (i.e. sensation-seeking with its biological basis as argued by Zuckerman, 1994) or easy to train (i.e. the socio-cognitive and experiential scales). Thus, the LSP provides the information argued by Blackburn (2000) to be essential as it provides information as to where and how intervention is possible, and whether it is likely to be successful.

The current studies have a number of strengths, including the fact that the participants were representative of a diverse and broad spectrum of organizations, the collection of objective (independent) supervisor ratings of follower performance in

order to reduce the effects of same-source bias (Study 2) and the supervisors did not select the follower to whom they rated (Study 2). The replication of findings from Study 1 to Study 2 and the fact that both studies were conducted in the field provides further support for the generalisability and external validity of results.

A limitation of Study 2 is that the sample size ($N = 58$ dyads) was relatively small compared to the number of variables in each analysis and the number of analyses performed. Whilst this is a potential limitation, it must also be stressed that our data consist of non-overlapping dyads (such that each supervisor almost certainly only rated one supervisee) and the sample was from many different organizations. Such data are not only very hard to collect but is also more generalisable and less problematical than most supervisor: follower dyads in which several followers generally share a supervisor. Nevertheless, a study with a larger sample of supervisor-follower dyads is warranted to confirm Study 2 findings.

In summary, in the current studies different models of approach and avoidance were compared in their predictiveness of work, university, and leadership outcomes. Biological, cognitive, experiential, and hybrid models were compared, and the evidence suggests that Jackson's (2005) hybrid model was a good comprehensive predictor. The least predictive model was the experiential model of Honey and Mumford (1992).

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References

- Aluja-Fabregat, A., & Torrubia-Beltri, R. (1998). Viewing of mass media violence, perception of violence, personality, and academic achievement. *Personality and Individual Differences, 25*, 973-989.
- Arnett, J. (1991). Winston Churchill, the quintessential sensation seeker. *Political Psychology, 12*, 609-621.
- Arnett, J. (1994). Sensation seeking: A new conceptualization and a new scale. *Personality and Individual Differences, 16*, 289-296.
- Aryee, S., Chen, Z. X., Sun, L., & Debrah, Y. A. (2007). Antecedents and outcomes of abusive supervision: Test of a trickle-down model. *Journal of Applied Psychology, 92*(1), 191-201.
- Ball, S. A., & Zuckerman, M. (1990). Sensation seeking, Eysenck's personality dimensions and reinforcement sensitivity in concept formation. *Personality and Individual Differences, 11*, 343-353.
- Ball, S. A., & Zuckerman, M. (1992). Sensation seeking and selective attention: Focused and divided attention on a dichotic listening task. *Journal of Personality and Social Psychology, 63*(5), 825-831.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 6*, 1173-1182.
- Barrick, M. R., & Mount, M. K. (1991). The Big-Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.
- Bass, B. M., & Avolio, B. J. (1997). *Full range leadership development: Manual for the multifactor leadership questionnaire*. Palo Alto, CA: Mind Garden.
- Bennett, R. J., & Robinson, S. L. (2000). Development of a measure of workplace deviance. *Journal of Applied Psychology, 85*, 349-360.

- Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology, 92*(2), 410-424.
- Blackburn, R. (2000). Treatment or incapacitation? Implications of research on personality disorders for the management of dangerous offenders. *Legal and Criminological Psychology, 5*, 1-23.
- Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin, 117*, 187-215.
- Bono, J. E., & Judge, T. A. (2003). Self-concordance at work: Toward understanding the motivational effects of transformational leaders. *Academy of Management Journal, 46*, 554-571.
- Bono, J. E., & Judge, T. A. (2004). Personality and transformational and transactional leadership: A meta-analysis. *Journal of Applied Psychology, 89*, 901-910.
- Carver, C. S. (2005). Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review, 9*, 312-333.
- Carver, C. S., Sutton, S. K., & Scheier, M. F. (2000). Action, emotion, and personality: Emerging conceptual integration. *Personality and Social Psychology Bulletin, 26*, 741-751.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.
- Chamorro-Premuzic, T., & Furnham, A. (2003a). Personality traits and academic examination performance. *European Journal of Personality, 17*, 237-250.
- Chamorro-Premuzic, T., & Furnham, A. (2003b). Personality predicts academic performance: Evidence from two longitudinal university samples. *Journal of Research in Personality, 37*, 319-338.
- Chamorro-Premuzic, T., & Furnham, A. (2005). *Personality and intellectual competence*. Mahwah, NJ: Erlbaum.
- Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry, 50*, 975-990.
- Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience and Biobehavioral Reviews. Special Issue: Festschrift in Honour of Jeffrey Gray - Issue 1: Anxiety and Neuroticism, 28*, 317-332.
- Costa, P. T. Jr., & McCrae, R. R. (1992). *NEO PI-R professional manual*. Odessa, FL: Psychological Assessment Resources Inc.
- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences, 22*, 491-569.
- Domangue, B. B. (1984). Sensation seeking and cognitive complexity. *Perceptual and Motor Skills, 58*, 3-20.
- Duff, A., & Duffy, T. (2002). Psychometric properties of Honey and Mumford's learning styles questionnaire (LSQ). *Personality and Individual Differences, 33*, 147-163.
- Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal, 45*(4), 735-744.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256-273.
- Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology, 82*, 804-818.
- Eysenck, H. J. (1967). *The biological basis of personality*. Springfield, IL: Thomas.
- Eysenck, H. J. (1997). Personality and experimental psychology: The unification of psychology and the possibility of a paradigm. *Journal of Personality and Social Psychology, 73*, 1224-1237.

- Eysenck, H. J., & Eysenck, S. B. G. (1991). *Manual of the Eysenck personality scales*. London: Hodder and Stoughton.
- Furnham, A., & Jackson, C. J. (2008). Reinforcement Sensitivity Theory in the work-place BIS/BAS in business. In P. Corr (Ed.), *Theory and application of Reinforcement Sensitivity Theory*. (pp.431-452) UK: Cambridge University Press.
- Furnham, A., & Thompson, J. (1991). Personality and self-reported delinquency. *Personality and Individual Differences*, 12, 585-593.
- Gable, S. L., Reis, H. T., & Elliot, A. J. (2000). Behavioral activation and inhibition in everyday life. *Journal of Personality and Social Psychology*, 78, 1135-1149.
- Gable, S. L., Reis, H. T., & Elliot, A. J. (2003). Evidence for bivariate models: An empirical test of appetite and aversion across domains. *Journal of Research in Personality*, 37, 349-372.
- Goldberg, L. R. (1999). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. J. Deary, F. de Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe: Vol. 7* (pp.7-28). Tilburg: Tilburg University Press.
- Gray, J. A. (1970). The psychophysiological basis of introversion-extraversion. *Behaviour Research and Therapy*, 8, 249-266.
- Gray, J. A., & McNaughton, N. (2000). *The neuropsychology of anxiety*. Oxford: Oxford University Press.
- Griffin, M. A., Neal, A., & Parker, S. (2001). *Multidimensional Performance Scale: Developing an integrated model of work performance*. Symposium presented at the 4th Australian Industrial and Organisational Psychology Conference, Sydney.
- Hom, P. W., & Griffeth, R. W. (1995). *Employee turnover*. Cincinnati, OH: South-Western.
- Honey, P., & Mumford, A. (1992). *The manual of learning styles*. Maidenhead, UK: Peter Honey.
- Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The big five revisited. *Journal of Applied Psychology*, 85, 869-879.
- Jackson, C. J. (2005). *An applied neuropsychological model of functional and dysfunctional learning: Applications for business, education, training and clinical psychology*. Australia: Cymeon.
- Jackson, C. J. (2008). Measurement issues concerning a personality model spanning temperament, character and experience. In G. Boyle, G. Matthews, & D. Saklofske (Eds.), *Handbook of personality testing* (pp.73-93). Thousand Oaks, CA: Sage Publishers.
- Johnson, D. E. (1998). *Applied multivariate methods for data analysts*. Pacific Grove, CA: Duxbury Press.
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluation traits - self-esteem, generalized self-efficacy, locus of control, and emotional stability - with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, 86(1), 80-92.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87(4), 765-780.
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, 87(3), 530-541.
- Kark, R., & Shamir, B. (2002). The dual effect of transformational leadership: Priming relational and collective selves and further effects on followers. In B. J. Avolio & F. J. Yammarino (Eds.), *Transformational and charismatic leadership: The road ahead* (pp.67-91). Oxford: Elsevier Science.
- Kolb, D. (1984). *Experiential learning*. Englewood Cliffs, NJ: Prentice Hall.
- Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in non-criminal populations. *Journal of Personality Assessment*, 66, 488-524.
- Lord, R. G., De Vader, C. L., & Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, 71(3), 402-410.

- Marcus, B., & Wagner, U. (2007). Combining dispositions and evaluations of vocation and job to account for counterproductive work behavior in adolescent job apprentices. *Journal of Occupational Health Psychology, 12*(2), 161-176.
- Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin, 108*(2), 171-194.
- Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior, 61*, 20-52.
- Moss, S. A., McFarland, J., Ngu, S., & Kijowska, A. (2007). Maintaining an open mind to closed individuals: The effect of resource availability and leadership style on the association between openness to experience and organizational commitment. *Journal of Research in Personality, 41*, 259-275.
- O'Connor, P. C., & Jackson, C. J. (2008). Learning to be saints or sinners: The indirect pathway from sensation seeking to behavior through mastery orientation. *Journal of Personality, 76*, 1-20.
- O'Connor, M. C., & Paunonen, S. V. (2007). Big five personality predictors of post-secondary academic performance. *Personality and Individual Differences, 43*, 971-990.
- Ones, D. S., Viswesvaran, C., & Reiss, A. D. (1996). Role of social desirability in personality testing for personnel selection: The red herring. *Journal of Applied Psychology, 81*, 660-679.
- Petrides, K. V., Chamorro-Premuzic, T., Frederickson, N., & Furnham, A. (2005). Explaining individual differences in scholastic behaviour and achievement. *British Journal of Educational Psychology, 75*, 239-255.
- Petrides, K. V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences, 29*, 313-320.
- Pickering, A. D. (2004). The neuropsychology of impulsive antisocial sensation seeking personality traits: From dopamine to hippocampal function? In R. M. Stelmack (Ed.), *On the psychobiology of personality: Essays in honour of Marvin Zuckerman* (pp. 455-478). Oxford: Elsevier.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.
- Reio, T., & Sanders-Reio, J. (2006). Sensation seeking as an inhibitor of job performance. *Personality and Individual Differences, 40*, 631-642.
- Revelle, W. (1995). Personality processes. *Annual Review of Psychology, 46*, 295-328.
- Robertson, I. T., & Kinder, A. (1993). Personality and job competencies: The criterion-related validity of some personality variables. *Journal of Occupational and Organizational Psychology, 66*, 226-244.
- Rotundo, M., & Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: A policy-capturing approach. *Journal of Applied Psychology, 87*, 66-80.
- Salgado, J. F. (1997). The five factor model of personality and job performance in the European Community. *Journal of Applied Psychology, 82*, 30-43.
- Sanchez-Marin, M., Rejano-Infante, E., & Rodriguez-Troyano, Y. (2001). Personality and academic productivity in the university student. *Social Behavior and Personality, 29*, 299-305.
- Schmidt, F. L., & Hunter, J. E. (1998). Validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*(2), 262-274.
- Smillie, L. D., Pickering, A. D., & Jackson, C. J. (2006). The new RST: Recent revisions to Reinforcement Sensitivity Theory, and implications for psychometric measurement. *Personality and Social Psychology Review, 10*, 320-335.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290-312). Washington, DC: American Sociological Association.

- Spector, P. E. (2006). Method variance in organizational research. Truth or Urban legend? *Organizational Research Methods*, 9(2), 221-232.
- Swales, S., & Senior, B. (1999). The dimensionality of Honey and Mumford's learning styles questionnaire. *International Journal of Selection and Assessment*, 7, 1-11.
- Tett, R. P., Jackson, D. N., & Rothstein, M. (1991). Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology*, 44, 703-742.
- Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology*, 46, 259-293.
- VandeWalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement*, 57, 995-1015.
- van Knippenberg, D., van Knippenberg, B., De Cremer, C., & Hogg, M. A. (2004). Leadership, self and identity: A review and research agenda. *Leadership Quarterly*, 15, 825-856.
- Wang, H., Law, K. S., Hackett, R. D., Wang, D., & Chen, Z. X. (2005). Leader-member exchange as a mediator of the relationship between transformational leadership and followers' performance and organizational citizenship behaviour. *Academy of Management Journal*, 48(3), 420-432.
- Warr, P., & Payne, R. (1983). Social class and reported changes in behaviour after job loss. *Journal of Applied Social Psychology*, 13, 206-222.
- Zuckerman, M. (1978). Dimensions of sensation seeking. In H. London & J. Exner (Eds.), *Dimensions of personality* (pp. 487-549). New York: Wiley.
- Zuckerman, M. (1994). *Behavioural expressions and biosocial bases of sensation seeking*. Cambridge, MA: Cambridge University Press.